

CLAIMS

1. An encoding method for encoding an original image, comprising:
 - 5 a decomposition step of decomposing an input original image into M (M is an integer and $M > 2$) uniform subbands; and
 - an encoding step of encoding signals, by using an embedded type entropy encoding method,
10 obtained by decomposing the original image into uniform subbands.
2. The encoding method as claimed in claim 1, the coding method further comprising a
15 quantization step of quantizing the signals obtained by the decomposition step, wherein signals obtained by the quantization step are encoded in the encoding step.
- 20 3. The encoding method as claimed in claim 1, wherein a uniform decomposing filter bank is used in the decomposition step, and EBCOT used in the still image international standard JPEG 2000 is used in the encoding step.
- 25 4. The encoding method as claimed in claim 1, wherein coded data obtained in the encoding step include information of resolution levels defined in ascending order of subband in the decomposed
30 subbands.
5. The encoding method as claimed in claim 4, wherein the coded data include information of resolution levels for a vertical direction and a
35 horizontal direction, respectively, in an image.
6. An encoding method of encoding an

original image, the encoding method comprising:

a transformation step of transforming an input original image into a plurality of coefficients by orthogonal transform; and
5 an encoding step of encoding the coefficients by using an embedded type entropy encoding method.

7. The encoding method as claimed in claim
10 6, wherein coded data obtained in the encoding step include information of resolution levels defined in ascending order of frequency in frequency components corresponding to the coefficients.

15 8. A decoding method of decoding coded data with a resolution of N/M times (M and N are integers, and $1 \leq N \leq M$ and $M > 2$) that of an original image, the decoding method comprising:

a decoding step of receiving the coded
20 data that are encoded by decomposing the original image into M uniform subbands, extracting N signals from decomposed signals from a low frequency side, and decoding the N signals by using an entropy decoding method; and

25 a bandwidth synthesizing step of synthesizing the N signals that are decoded.

9. The decoding method as claimed in claim
30 8, the decoding method further comprising an inverse quantization step of inverse-quantizing the signals obtained by the decoding step, wherein signals that are obtained by the inverse quantization step are synthesized in the bandwidth synthesizing step.

35 10. The decoding method as claimed in claim 8, wherein EBCOT used in the still image international standard JPEG 2000 is used as the

entropy decoding method in the decoding step, and a uniform decomposing filter bank is used in the bandwidth synthesizing step.

5 11. The decoding method as claimed in claim 8, the decoding method further comprising a calculation step of obtaining a resolution of the original image and a predetermined resolution, and calculating the value N suitable for the
10 predetermined resolution by using the resolution of the original image and the decomposition number M.

 12. A decoding method of decoding coded data with a resolution of N/M times (M and N are
15 integers, and $1 \leq N \leq M$ and $M > 2$) that of an original image, the decoding method comprising:

 a decoding step of receiving the coded data that are encoded by decomposing the original image into M coefficients of frequency components,
20 extracting N signals from decomposed signals from a low frequency component side, and decoding the N signals by using an entropy decoding method; and

 a bandwidth synthesizing step of synthesizing the N signals that are decoded.

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 13. An encoding apparatus for encoding an original image, the encoding apparatus comprising:

 a decomposition part decomposing an input original image into M (M is an integer and $M > 2$)
30 uniform subbands; and

 an encoding part encoding signals, by using an embedded type entropy encoding method, obtained by decomposing the original image into uniform subbands.

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 14. The encoding apparatus as claimed in claim 13, the encoding apparatus further comprising

a quantization part quantizing the signals obtained by the decomposition part, wherein signals obtained by the quantization part are encoded in the encoding part.

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15. The encoding apparatus as claimed in claim 13, wherein a uniform decomposing filter bank is used in the decomposition part, and EBCOT used in the still image international standard JPEG 2000 is used in the encoding part.

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16. The encoding apparatus as claimed in claim 13, wherein coded data obtained in the encoding part include information of resolution levels defined in ascending order of subband in the decomposed subbands.

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17. The encoding apparatus as claimed in claim 16, wherein the coded data include information of resolution levels for a vertical direction and a horizontal direction, respectively, in an image.

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18. An encoding apparatus for encoding an original image, the encoding apparatus comprising:
a transformation part transforming an input original image into a plurality of coefficients by orthogonal transform; and
an encoding part encoding the coefficients by using an embedded type entropy encoding method.

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19. The encoding apparatus as claimed in claim 18, wherein coded data obtained in the encoding part include information of resolution levels defined in ascending order of frequency in frequency components corresponding to the coefficients.

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20. A decoding apparatus for decoding coded data with a resolution of N/M times (M and N are integers, and $1 \leq N \leq M$ and $M > 2$) that of an original image, the decoding apparatus comprising:

- 5 a decoding part receiving the coded data that are encoded by decomposing the original image into M uniform subbands, extracting N signals from decomposed signals from a low frequency side, and decoding the N signals by using an entropy decoding
10 method; and
 a bandwidth synthesizing part synthesizing the N signals that are decoded.

21. The decoding apparatus as claimed in
15 claim 20, the decoding apparatus further comprising an inverse quantization part inverse-quantizing the signals obtained by the decoding part, wherein signals that are obtained by the inverse
quantization part are synthesized in the bandwidth
20 synthesizing part.

22. The decoding apparatus as claimed in claim 20, wherein EBCOT used in the still image international standard JPEG 2000 is used as the
25 entropy decoding method in the decoding part, and a uniform decomposing filter bank is used in the bandwidth synthesizing part.

23. The decoding apparatus as claimed in
30 claim 20, the decoding apparatus further comprising a calculation part obtaining a resolution of the original image and a predetermined resolution, and calculating the value N suitable for the
predetermined resolution by using the resolution of
35 the original image and the decomposition number M .

24. A decoding apparatus of decoding coded

data with a resolution of N/M times (M and N are integers, and $1 \leq N \leq M$ and $M > 2$) that of an original image, the decoding apparatus comprising:

5 a decoding part receiving the coded data that are encoded by decomposing the original image into M coefficients of frequency components, extracting N signals from decomposed signals from a low frequency component side, and decoding the N signals by using an entropy decoding method; and
10 a bandwidth synthesizing part synthesizing the N signals that are decoded.

25. A program for causing a computer to perform encoding processes for an original image,
15 wherein the program causes the computer to perform:

a decomposition step of decomposing an input original image into M (M is an integer and $M > 2$) uniform subbands; and
an encoding step of encoding signals, by
20 using an embedded type entropy encoding method, obtained by decomposing the original image into uniform subbands.

26. The program as claimed in claim 25,
25 wherein the program further causes the computer to perform a quantization step of quantizing the signals obtained by the decomposition step, wherein signals obtained by the quantization step are encoded in the encoding step.

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27. A program for causing a computer to perform encoding processes for an original image, wherein the program causes the computer to perform:

a transformation step of transforming an
35 input original image into a plurality of coefficients by orthogonal transform; and
an encoding step of encoding the

coefficients by using an embedded type entropy encoding method.

28. A program for causing a computer to
5 perform decoding processes for decoding coded data
with a resolution of N/M times (M and N are integers,
and $1 \leq N \leq M$ and $M > 2$) that of an original image,
wherein the program causes the computer to perform:
a decoding step of receiving the coded
10 data that are encoded by decomposing the original
image into M uniform subbands, extracting N signals
from decomposed signals from a low frequency side,
and decoding the N signals by using an entropy
decoding method; and
15 a bandwidth synthesizing step of
synthesizing the N signals that are decoded.

29. The program as claimed in claim 28,
the program further causing the computer to perform
20 an inverse quantization step of inverse-quantizing
the signals obtained by the decoding step, wherein
signals that are obtained by the inverse
quantization step are synthesized in the bandwidth
synthesizing step.

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30. A program for causing a computer to
perform decoding processes for decoding coded data
with a resolution of N/M times (M and N are integers,
and $1 \leq N \leq M$ and $M > 2$) that of an original image,
30 wherein the program causes the computer to perform:
a decoding step of receiving the coded
data that are encoded by decomposing the original
image into M coefficients of frequency components,
extracting N signals from decomposed signals from a
35 low frequency component side, and decoding the N
signals by using an entropy decoding method; and
a bandwidth synthesizing step of

synthesizing the N signals that are decoded.

31. A computer readable recording medium
that records a program for causing a computer to
5 perform encoding processes for an original image,
wherein the program causes the computer to perform:
a decomposition step of decomposing an
input original image into M (M is an integer and
M>2) uniform subbands; and
10 an encoding step of encoding signals, by
using an embedded type entropy encoding method,
obtained by decomposing the original image into
uniform subbands.

32. The computer readable recording medium
15 as claimed in claim 31, wherein the program further
causes the computer to perform a quantization step
of quantizing the signals obtained by the
decomposing step, wherein signals obtained by the
20 quantization step are encoded in the encoding step.

33. A computer readable recording medium
that records a program for causing a computer to
perform encoding processes for an original image,
25 wherein the program causes the computer to perform:
a transformation step of transforming an
input original image into a plurality of
coefficients by orthogonal transform; and
an encoding step of encoding the
30 coefficients by using an embedded type entropy
encoding method.

34. A computer readable recording medium
that records a program for causing a computer to
35 perform decoding processes for decoding coded data
with a resolution of N/M times (M and N are integers,
and $1 \leq N \leq M$ and $M > 2$) that of an original image,

wherein the program causes the computer to perform:

5 a decoding step of receiving the coded
data that are encoded by decomposing the original
image into M uniform subbands, extracting N signals
from decomposed signals from a low frequency side,
and decoding the N signals by using an entropy
decoding method; and

10 a bandwidth synthesizing step of
synthesizing the N signals that are decoded.

35. The computer readable recording medium
as claimed in claim 34, the program further causing
the computer to perform an inverse quantization step
of inverse-quantizing the signals obtained by the
15 decoding step, wherein signals that are obtained by
the inverse quantization step are synthesized in the
bandwidth synthesizing step.

36. A computer readable recording medium
20 that records a program for causing a computer to
perform decoding processes for decoding coded data
with a resolution of N/M times (M and N are integers,
and $1 \leq N \leq M$ and $M > 2$) that of an original image,
wherein the program causes the computer to perform:

25 a decoding step of receiving the coded
data that are encoded by decomposing the original
image into M coefficients of frequency components,
extracting N signals from decomposed signals from a
low frequency component side, and decoding the N
30 signals by using an entropy decoding method; and

 a bandwidth synthesizing step of
synthesizing the N signals that are decoded.

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